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Electrophysiological evaluation of atrioventricular conduction disturbances in transcatheter aortic valve implantation with Edwards Sapien prosthesis

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Purpose: Permanent pacemaker requirement is a known complication after transcatheter aortic valve implantation (TAVI). The aim of the present study was to analyze the effects of Edwards Sapien prosthesis implantation on atrioventricular conduction system.

Methods: The study included 28 patients who underwent TAVI due to severe aortic valve stenosis. An electrophysiological study was performed in the catheterization room immediately before the initial balloon valvuloplasty and immediately after Edwards Sapien prosthesis implantation.

Results: HV interval was significantly prolonged after the procedure (55.9±11.5 ms) in comparison to before the procedure (47.3±7.8 ms) (p<0.001). The antegrade Wenkebach point was observed as being significantly chronically delayed; after the procedure, a procedure (354.4±41.3) rather than before (337.7±45.4) (p<0.001). Despite AH interval prolongation, it was not statistically significant. After the procedure, we observed significant conduction disturbances in three (10.7%) patients. These conduction problems recovered before discharge. One of the patients (3.6%) with RBBB+LAFB required permanent pacemaker implantation. At electrocardiogram after procedure QRS duration increased, QRS axis shifted to the left and both of the values became normal before discharge. The patients’ echocardiographic and clinical parameters were improved during follow-up.

Conclusions: The effects of Edwards Sapien on the conduction system was mostly infranodal and temporary. The physical properties of the Edwards Sapien prosthesis may explain this observation. This complication may be lessened if the frame height characteristics can be improved.

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Clopidogrel fails to provide adequate biological efficiency before TAVI procedure

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Introduction: Aspirin and clopidogrel are recommended in the context of TAVI (Transcatheter Aortic Valve Implantation). However, there is poor clinical and no biological data assessing the efficiency of such antiplatelet therapy in the TAVI population. Finally, the best regimen of antiplatelet therapy, particularly regarding the loading dose (LD) of clopidogrel, remains to be defined.

Aim of the study: We hypothesize that the recommended 300mg clopidogrel LD is unable to provide efficient P2Y12 inhibition for TAVI procedure. During a first period we check our hypothesis, and during a second period, we test a stronger and biologically adjusted clopidogrel regimen.

Materials and methods: We prospectively studied platelet reactivity before TAVI procedure, using P2Y12 VerifyNow® assay. High platelet reactivity was defined by PRU value above 230. Patients already treated with P2Y12 inhibitors were excluded. In the first period, a 300mg Clopidogrel LD was administered the day before TAVI procedure (day-1) and platelet reactivity was assessed the following morning (day0). During the second period, we used a 600mg clopidogrel LD, two years before TAVI (day-2). At day-1, patients with a PRU > 230 received a second 300mg clopidogrel LD. At day0, patients who remained low-responders received a third loading dose of 300mg.

Results: In the first period, 23 patients were tested 14±2 hours after LD. The mean PRU value was 253±73 at day0. High platelet reactivity was still present in 16 patients with a mean PRU value at 294±40 and only 7 patients (30.4%) were good responders with a mean PRU value at 160±35 at day0. In the second period, 15 patients were pretreated with high clopidogrel LD at day-2. The mean PRU value at day-1 was 256±47 and 6 patients (40%) reached the cut-off of efficiency at day-1. Among the 9 non-responders patients only 4 reached the cut-off of efficiency after 300mg, and finally 10 patients (67%) had a PRU>230 at day0. Among the 5 remaining patients, one was not implanted. At the end, after 1200mg, only one of the 4 remaining patients reached the cut-off of efficiency the day after TAVI. Finally, this second regimen provided a higher biological efficiency with 11 good responders patients (79%), but with a mean total loading dose of 880mg of clopidogrel.

Conclusion: Recommended loading dose of 300mg of clopidogrel the day before the procedure fails to provide biological efficiency for TAVI procedure. Better results can be obtained but with a huge increase in the clopidogrel doses. Further studies are required to assess the clinical consequences of these biological data.